1 BLT set 6 over GF(25)

Points on the quadric $x_0^2 + x_1x_2 + x_3x_4$:

$P_1 = (0, 1, 0, 0, 0)$

$P_2 = (0, 0, 1, 0, 0)$

$P_3 = (0, 1, 17, 4, 17)$

$P_4 = (0, 1, 7, 22, 20)$

$P_5 = (0, 1, 16, 2, 7)$

$P_6 = (1, 9, 19, 6, 15)$

$P_7 = (1, 12, 21, 20, 24)$

$P_8 = (1, 19, 15, 1, 22)$

$P_9 = (1, 15, 19, 21, 16)$

$P_{10} = (0, 1, 16, 19, 5)$

$P_{11} = (1, 3, 15, 10, 24)$

$P_{12} = (1, 4, 21, 19, 9)$

$P_{13} = (1, 4, 10, 17, 24)$

$P_{14} = (1, 24, 13, 9, 2)$

$P_{15} = (1, 4, 20, 20, 14)$

$P_{16} = (1, 16, 24, 8, 15)$

$P_{17} = (1, 14, 24, 1, 19)$

$P_{18} = (1, 5, 3, 18, 21)$

$P_{19} = (1, 24, 9, 4, 24)$

$P_{20} = (1, 16, 19, 16, 9)$

$P_{21} = (1, 2, 15, 5, 16)$

$P_{22} = (1, 18, 9, 24, 20)$

$P_{23} = (1, 19, 17, 10, 20)$

$P_{24} = (1, 21, 18, 8, 9)$

$P_{25} = (1, 22, 21, 4, 16)$

$P_{26} = (1, 9, 2, 16, 1)$

Stabilizer of order 100 is generated by:

$$g_1 = \begin{pmatrix} 19 & 0 & 0 & 3 & 21 \\ 0 & 0 & 5 & 0 & 0 \\ 0 & 13 & 0 & 0 & 0 \\ 13 & 0 & 0 & 5 & 16 \\ 4 & 0 & 0 & 17 & 5 \end{pmatrix}, 0$$

with 28 fixed points

$$g_2 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 12 & 7 & 18 & 7 \\ 0 & 15 & 12 & 5 & 24 \\ 0 & 24 & 7 & 18 & 14 \\ 0 & 5 & 18 & 20 & 18 \end{pmatrix}, 0$$

with 28 fixed points

$$g_3 = \begin{pmatrix} 18 & 0 & 3 & 4 & 10 \\ 15 & 18 & 13 & 18 & 11 \\ 0 & 0 & 11 & 0 & 0 \\ 12 & 0 & 5 & 19 & 1 \\ 23 & 0 & 15 & 12 & 22 \end{pmatrix}, 1$$

with 8 fixed points

$$g_4 = \begin{pmatrix} 10 & 24 & 0 & 4 & 21 \\ 0 & 1 & 0 & 0 & 0 \\ 12 & 14 & 1 & 8 & 13 \\ 13 & 13 & 0 & 22 & 19 \\ 2 & 8 & 0 & 24 & 22 \end{pmatrix}, 0$$

with 28 fixed points

$$g_5 = \begin{pmatrix} 20 & 2 & 0 & 23 & 1 \\ 0 & 18 & 0 & 0 & 0 \\ 10 & 21 & 11 & 15 & 12 \\ 20 & 9 & 0 & 2 & 11 \\ 8 & 8 & 0 & 1 & 18 \end{pmatrix}, 1$$

with 8 fixed points The induced group has order 100 and is generated by:

g_1 =(26)(21)(5, 12)(7, 11)(9, 15)(10, 18)(14, 17)(13, 19)(16, 22)(20, 25)(6, 8)(23, 24)(3, 4)(1, 2)

g_2 =(21)(7)(4, 10)(13, 25)(8, 19)(9, 20)(12, 23)(11, 14)(6, 16)(15, 22)(17, 26)(18, 24)(2, 5)(1, 3)

g_3 =(21)(2)(3, 5, 12, 13)(6, 17, 26, 22)(7, 10, 25, 24)(14, 18, 19, 15)(4, 11, 16, 9)(1, 20, 8, 23)

g_4 =(1)(21)(3, 22)(7, 15)(8, 26)(9, 10)(12, 19)(11, 20)(13, 17)(14, 16)(18, 23)(4, 5)(24, 25)(2, 6)

g_5 =(21)(1)(3, 7, 22, 15)(8, 14, 26, 16)(9, 17, 10, 13)(11, 18, 20, 23)(4, 12, 5, 19)(2, 25, 6, 24)

Kernel has order 1 and is generated by:

There are 2 orbits on the BLT set.

The orbit length are $[25, 1]$

The orbits are:

$O_0 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26\}$ (length 25)

$O_1 = \{21\}$ (length 1)

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26\}$ (length 25)

The induced group has order 100 and is generated by:

g_1 =(25)(5, 12)(13, 19)(7, 11)(9, 15)(10, 18)(6, 8)(14, 17)(16, 21)(20, 24)(22, 23)(3, 4)(1, 2)

g_2 =(7)(4, 10)(11, 14)(13, 24)(8, 19)(9, 20)(6, 16)(12, 22)(2, 5)(15, 21)(17, 25)(18, 23)(1, 3)

$g_3 =$(2)(3, 5, 12, 13)(4, 11, 16, 9)(6, 17, 25, 21)(7, 10, 24, 23)(14, 18, 19, 15)(1, 20, 8, 22)

$g_4 =$(1)(3, 21)(11, 20)(7, 15)(8, 25)(9, 10)(4, 5)(12, 19)(13, 17)(14, 16)(18, 22)(23, 24)(2, 6)

$g_5 =$(1)(3, 7, 21, 15)(4, 12, 5, 19)(8, 14, 25, 16)(9, 17, 10, 13)(11, 18, 20, 22)(2, 24, 6, 23)

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{21\}$ (length 1)

The induced group has order 1 and is generated by:

$g_1 =$(1)

$g_2 =$(1)

$g_3 =$(1)

$g_4 =$(1)

$g_5 =$(1)

group order is small, so we list all elements

$a_1 =$(1)

and now the elements themselves: $a_1 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$, 0 with 26 fixed points

Kernel has order 100 and is generated by:

$$b_1 = \begin{pmatrix} 16 & 0 & 13 & 24 & 11 \\ 4 & 2 & 17 & 13 & 22 \\ 10 & 15 & 3 & 22 & 16 \\ 6 & 2 & 6 & 10 & 21 \\ 2 & 10 & 16 & 23 & 19 \end{pmatrix}, 1$$

$$b_2 = \begin{pmatrix} 3 & 24 & 13 & 18 & 18 \\ 12 & 22 & 23 & 14 & 24 \\ 16 & 5 & 8 & 15 & 6 \\ 1 & 1 & 4 & 7 & 0 \\ 8 & 12 & 15 & 4 & 20 \end{pmatrix}, 0$$

$$b_3 = \begin{pmatrix} 4 & 0 & 0 & 0 & 0 \\ 0 & 4 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 \\ 0 & 0 & 0 & 4 & 0 \\ 0 & 0 & 0 & 0 & 4 \end{pmatrix}, 0$$

$$b_4 = \begin{pmatrix} 15 & 6 & 0 & 1 & 9 \\ 0 & 4 & 0 & 0 & 0 \\ 18 & 16 & 4 & 22 & 17 \\ 17 & 17 & 0 & 8 & 11 \\ 3 & 22 & 0 & 6 & 8 \end{pmatrix}, 0$$

$$b_5 = \begin{pmatrix} 5 & 3 & 0 & 7 & 4 \\ 0 & 12 & 0 & 0 & 0 \\ 15 & 9 & 19 & 10 & 18 \\ 5 & 21 & 0 & 3 & 19 \\ 22 & 22 & 0 & 4 & 12 \end{pmatrix}, 1$$

The kernel has 174 orbits on the quadric.

The orbit length are $[100^{156}, 50^{10}, 25^{7}, 1]$